REMARKS/ARGUMENTS

Election/Restriction Requirement

The claims were subject to an election/restriction requirement and thus, only claims 1 through 53 are under consideration in this application. Claims 54 through 62 have been withdrawn. No new matter has been added.

Amendments to the Specification

The amendments to the specification are responsive to the Office Action to provide patent application serial numbers that had not yet been assigned and to correct any typographical errors. No new matter has been added.

Double Patenting

Claims 6-18, 42, 52, and 53 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1, 5-13, and 18-38, 44, and 45 of co-pending Application No. 10/720,607. Attached is a responsive Terminal Disclaimer which would overcome an actual rejection should a patent issue on the co-pending application. Withdrawal of the provisional double patenting rejection is respectfully requested.

35 U.S.C. 102(e) Rejection of Claims 1-5 over Uzio et al. '280

The Examiner has rejected claims 1 through 5 under 35 U.S.C. 102(e) as being anticipated by Uzio et al. in U.S. Patent 6,498,280. Specifically, the Examiner noted that Uzio et al. teach a catalyst comprising at least one support, at least one element from Groups 8, 9, or 10 of the Periodic Table, at least one element from Group 14 of the Periodic table, at least one element from Group 13 of the Periodic table, at least one alkali or alkaline earth metal, and, optionally, at least one halogen. (Col. 4, lines 8-14). The Examiner noted that examples of Group 8, 9, or 10 metals include rhodium, ruthenium, iron, and cobalt, although platinum was preferred. The selected metal(s) from these groups is present in the catalyst in amounts ranging from 0.01% to 5% by weight with respect to the total catalyst. (Col. 4, lines 15-21).

The Examiner further noted that the Group 14 element (tin, germanium, lead) is present in an amount ranging from 0.01% to 5% by weight relative to the total catalyst weight (Col. 4,

lines 20-25). The Group 13 element is selected from indium, gallium, and thallium, preferably indium, and is present in amounts ranging from 0.005% to 3% by weight relative to the total catalyst weight. (Col. 4, lines 26-29). The Examiner also notes that examples of the supports include aluminas. (Col. 4, lines 42-50).

Uzio et al.

Applicants respectfully note that Uzio et al. disclose a dehydrogenation catalyst requiring at least one item from each of 5 different component categories. Even selecting one item from each of the categories results in over 300 possible combinations of metals excluding the added variables of which support is used and whether and which halogen is used. Looking further at multiple selections from the various categories, the range of possibilities increases exponentially. Even just looking at selecting 2 metals from Groups 8, 9, and 10 gives over 2500 possible metal combinations. The number of potential combinations is such that undue experimentation would be required to identify Applicants' invention.

Applicants further note that Uzio et al. not only do not present any specific description of selecting a second component from any of the disclosed categories, the examples provided all use platinum, tin, indium, lithium, and chlorine in varying quantities. Within the four corners of the disclosure of Uzio et al., there is no teaching to use Applicants' selection of at least two metals from Groups 8, 9, and 10 and at least one from Group 13 of the Periodic Table of Elements. It is respectfully submitted that one of ordinary skill in the art would not have been able to identify Applicants' invention from the disclosure of Uzio et al. and further that one of ordinary skill in the art would not have considered the Uzio et al. description of a dehydrogenation catalyst in attempting to develop a superior hydrogenation catalyst.

Catalysis is an unpredictable art, and Applicants respectfully submit that the disclosure of the Uzio et al. reference is neither sufficient to anticipate nor to render obvious the presently claimed invention. It is respectfully submitted that Uzio et al. disclose neither the selection criteria nor the utility of the presently claimed catalyst and, therefore, neither anticipate nor render it obvious under *In re Ruschig* (145 USPQ 274, 285-86 (CCPA)).

35U.S.C. 103(a) Rejection of Claims 6-45 and 47-52 over Uzio '280

The Examiner cites the same disclosures from Uzio et al. in rejecting claims 6 through 45 and 47 through 52 under 35 U.S.C. 103(a). The Examiner states that: "Patentees' catalyst can be prepared by successive steps of depositing the metals, using any technique known in the art. These deposition steps can be performed in any order. Deposition can be performed by dry or excess impregnation, or by an ion exchange method. Calcining can be performed at temperatures of about 500°C. See col. 4, lines 52-64 of Uzio et al."

Applicants respectfully traverse the rejection because Applicants' claimed selection is not taught or suggested by Uzio et al. and because there is no motivation for the skilled artisan to make Applicants' selection for a hydrogenation catalyst from the dehydrogenation disclosure of Uzio et al.

Numerous selections are offered as possible but only certain dispersed platinum, chlorine limited combinations are actually taught and exemplified.

Applicants' claimed invention

The invention of claim 6 requires a combination including rhodium, a Group 13 metal, and a third component. There is no discernible teaching of Uzio et al. to combine rhodium with the other components. Uzio et al. teach certain platinum dehydrogenation catalysts and Uzio et al. just provide a laundry list of Group 8, 9, and 10 metals for completeness. There is no guidance for the skilled artisan to select rhodium over the industry-established platinum for dehydrogenation.

Applicants have discovered by numerous multiple trials that the claimed selections with rhodium are, in fact, superior for selective hydrogenation of alkynes and diolefins in an olefin stream. The motivation for the selection was nowhere recognized by Uzio et al. Applicants submit that it would be illogical to assume that the skilled artisan would be prompted to derive the claimed invention, useful for specific hydrogenation, from the hundreds of possible (but not suggested) combinations and permutations in the Uzio et al. disclosure for dehydrogenation.

The Examiner's attention is especially directed to claims 18-41 wherein the specific selection of rhodium, indium and one of iron, ruthenium, and cobalt are claimed. One could

hardly suggest that this combination, so valuable for certain hydrogenations of alkynes (especially acetylene) and diolefins, would be selected from the clearly platinum-based dehydrogenation teachings of Uzio et al.

Claims 42-53 are especially directed to applying to a support, the selected metals useful for alkyne/diolefin hydrogenation. Once again, the selection of the claimed invention including rhodium is not taught. No rhodium compounds like the rhodium nitrate of claim 46 are even suggested because Uzio et al. focused on chloroplatinic acid only.

Withdrawal of the 35 USC 103 rejection of claims 6-45 and 47-52 is respectfully requested.

35 U.S.C. 103(a) Rejection of Claims 1-20, 23-32, 35-47, and 49-53 over Shepherd et al. '866

The Examiner cites Shepherd et al. in rejecting claims 1-20, 23-32, 35-47, and 49-53 under 35 U.S.C. 103(a). The Examiner states that: "Optionally, the catalyst may contain other components or mixtures thereof which act alone or in concert as catalyst modifiers to improve activity, selectivity, or stability. Examples of these components include rhenium, gallium, indium, nickel, iron, tungsten, molybdenum, zinc, and cadmium. Catalytically effective amounts of these components may be added in any suitable manner to the carrier material during or after its preparation, or to the catalytic composite before, while, or after other components are being incorporated. Amounts of these components range from about 0.01 to about 5 mass% of the composite. See col. 5, line 59 to col. 6, line 4 of Shepherd et al. This disclosure is considered to read upon Applicants' claim limitations regarding the metal components Groups 8-10 and 1-15 of the Periodic Table, as recited in the instant claims."

Applicants respectfully traverse the rejection because the claimed selections are not taught or fairly suggested by Shepherd et al.

Shepherd et al.

Shepherd et al. teach a shaped alumina catalyst that is gamma phase, calcined, has specified piece strength, and has a certain X-ray diffraction pattern. The catalyst may be loaded with a variety of metals and other materials from myriad combinations suggested in columns 4-6. Even the platinum group components are considered optional by Shepherd et al. Of the ten

specific applications listed by Shepherd et al. at column 8, lines 9-14, hydrogenation of alkynes/diolefins is not suggested. No motivation is present to arrive at the claimed combinations of the present invention. As before, Applicants respectfully submit that it would be unrealistic to expect the skilled artisan to obtain the presently claimed invention without undue experimentation and without guidance from the present disclosure to seek a catalyst useful for alkyne/diolefin hydrogenation.

The weight/mass ranges suggested by the references overlap only on the low end of ranges for the present invention. This is because of different applications of the catalysts and concerns about conflicting side processes. See, e.g., Uzio et al. at column 1, lines 36-49 and column 2, lines 53-60. This agains shows a contrary motivation in the references.

The guiding principle of Shepherd et al. is to provide piece strength from a gamma alumina so as to avoid particle deterioration and resulting process clogging and other problems. See column 1, lines 54-65.

There is no teaching or suggestion by Shepherd et al. to use more than one Group 8-10 metal as defined in claims 1-5.

Shepherd et al. do not teach selection of rhodium plus Group 13 plus a third component to formulate a catalyst, as set forth in claims 6-24 and 42-53.

There is certainly no suggestion or teaching by Shepherd et al. to combine rhodium, indium, and one of iron, ruthenium, and cobalt as defined in claims 25-41.

The skilled artisan would not be motivated to select certain metals from Uzio et al. to obtain Applicants' invention because neither Uzio et al. nor Shepherd et al. are directed to hydrogenation of alkynes and diolefins in an olefin stream, the motivation for the present invention. For example, it can hardly be expected that the skilled artisan would select the combination of claim 25 when Uzio et al. clearly choose platinum and Shepherd et al. add nothing further for the particular selection of indium and one of iron, ruthenium, and cobalt--for any intended use. It is respectfully submitted that only hindsight reconstruction can lead to the selections of the present claims.

Withdrawal of the 35 USC 103 rejection of claims 1-20, 23-32, 35-47, and 49-53 is respectfully requested.

CONCLUSION

In view of the submitted Terminal Disclaimer and the Remarks above, withdrawal of the rejections and allowance of the application are respectfully requested.

If it would be of assistance to resolve any outstanding issues in the present application, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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